

178° W., winds as high as force 11 were again encountered. The neighborhood was stormy on several other dates, but no winds exceeding force 9 were reported.

Exceptionally heavy weather occurred off the Oregon and Washington coasts, and thence for several hundred miles seaward, during several days of January from the 1st to the 12th. On the 1st, south to southwest gales of force 9-10 were reported by the steamships *Mexican* and *Stanley Hiller* close in along the coast between 43° and 45° N. The maximum wind velocity at the North Head Weather Bureau Station on that date was 56 miles from the south. On the 3d and 4th the highest velocities reported at North Head were 57 and 56 miles, respectively, and during these days a long stretch of coast line was battered by high winds and seas which caused heavy damage to communication systems and other property. At sea, strong gales to hurricane velocities were experienced within the locality 43°-46° N., 130°-145° W., on the 3d, while on the 4th scattered westerly gales within much the same area were encountered of force up to 10.

Low pressure persisted over the northeastern part of the ocean between the 4th and 11th, but the weather meanwhile appears to have been only moderately stormy, with no gales at sea reported in excess of force 8, and those far from the coast. On the 12th, however, storminess increased locally along the Oregon coast and in the neighboring portions of the sea. The wind became violent during the night of the 11-12th near the mouth of the Columbia River, and the American steamer *Iowa*, caught in the early morning in a heavy gale, was wrecked on Peacock Spit, the so-called graveyard of ships, about 3 miles southwest of North Head Station, where she was lost with her entire crew of 34 men. This is reported as having been the first major marine disaster at that point since 1913. At North Head the maximum wind velocity registered that day was 73 miles from the south. At sea southerly gales of force 10 were reported on the 12th by the American steamers *General Lee* and *Golden Tide*, the first at 7 a. m., in 41°36' N., 134° W., the second at 11 a. m., in 39°31' N., 126°25' W.

Along the middle stretches of the northern steamship routes gales were moderately frequent during the month,

but so far as reported, despite the prevailing low pressures accompanying them, did not exceed 9 in force.

Tropical cyclones.—The subjoined report by the Reverend Bernard F. Doucette, S. J., of the Manila Observatory, indicates that two tropical disturbances, one of minor nature, occurred in the Far East during January 1936.

Tehuantepecers.—Ships traversing the Gulf of Tehuantepec reported northers of force 7 on the 7th and 20th, and of force 11, on the 22d.

Fog.—Fog was reported on 4 days off the Washington and Oregon coasts; on 10 days off the California coast, and on 2 days off the coast of Lower California. Farther at sea the occurrence of fog was rare and scattered.

TYPHOON AND DEPRESSION OVER THE FAR EAST, JANUARY 1936

By BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Two disturbances, one a typhoon, the other a depression, appeared during the first few days of the month. The depression affected the weather of the Philippines; the typhoon, however, remained at a distance in the Pacific Ocean.

Typhoon, December 31, 1935, to January 3, 1936.—A typhoon formed over the Eastern Caroline Islands, intensifying on the last day of the year near latitude 8.20° N., longitude 150° E. It moved WNW. about 1,150 miles and filled up January 3, 1936, in the regions around latitude 14° N., longitude 136° E.

Depression, December 29, 1935, to January 3, 1936.—Forming about 120 miles S. of Yap, this mild depression moved WNW. toward the Philippines. It passed over Surigao Strait, then across Leyte, Cebu, and Panay Islands on its way to Mindoro Island, where it recurved to the NE. It passed over the Camarines Provinces on its way to the Pacific Ocean, where it filled up, about 120 miles away from the coast. This depression was of little importance with respect to resulting damage, though considerable rain fell over the Visayan Islands and shipping was delayed slightly.

CLIMATOLOGICAL TABLES

DESCRIPTION OF TABLES AND CHARTS

(R. J. Martin)

Table 1 gives the data ordinarily needed for climatological studies for about 180 Weather Bureau stations making simultaneous observations at 8 a. m. and 8 p. m. daily, seventy-fifth meridian time, and for about 20 others making only one observation. The altitudes of the instruments above ground are also given.

Beginning with January 1, 1932, all wind movements and velocities published herein are corrected to true values by applying to the anemometer readings corrections determined by actual tests in wind tunnels and elsewhere.

Table 2 gives, for about 37 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation, depth of snowfall, and the respective departures from normal values except in the case of snowfall. The sea-level pressures have been computed according to the method described by Prof. F. H. Bigelow in the REVIEW of January 1902, 30: 13-16.

Table 3 lists the severe local storms reported in the United States during the month. It is compiled from reports furnished mostly by officials of the Weather Bureau.

CHART I.—*Temperature departures.*—This chart presents the departures of the monthly mean surface temperatures from the monthly normals. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly surface temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July 1909, but smaller charts appear in W. B. Bulletin U for 1873 to June 1909, inclusive.

CHART II.—*Tracks of centers of ANTICYCLONES;* and

CHART III.—*Tracks of centers of CYCLONES.* The roman numerals show the chronological order of the centers. The figures within the circles show the days of the month, the location indicated being that at 8 a. m., seventy-fifth meridian time. Within each circle is also an entry of the last three figures of the highest barometric reading (chart II), or (chart III) the lowest reading reported at or near the center at that time, in both cases as reduced to sea level and standard gravity. The intermediate 8 p. m. locations are indicated by dots. The inset map on chart II shows the departure of monthly mean pressure from normal and the inset on chart III

shows the change in mean pressure from the preceding month.

The use of a new base map for charts II and III began with the January 1930 issue.

CHART IV.—Percentage of clear sky between sunrise and sunset.—The average cloudiness at each regular Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the night hours.

CHART V.—Total precipitation.—The scales of shading with appropriate lines show the distribution of the monthly precipitation according to reports from both regular and cooperative observers. The inset on this chart shows the departure of the monthly totals from the corresponding normals, as indicated by the reports from the regular stations.

CHART VI.—Isobars at sea level, and isotherms at surface; prevailing winds.—The pressures have been reduced to sea level and standard gravity by the method described by Prof. Frank H. Bigelow in the REVIEW for January 1902, 30: 13-16. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of 8 a. m. and 8 p. m. readings at stations taking two observations daily, and to the 8 a. m. or the 8 p. m. observation, at stations taking but a single observation.

The diurnal corrections so applied, except for stations established since 1901, will be found in the Annual Report of the Chief of the Weather Bureau, 1900-1901, volume 2, table 27, pages 140-164.

The sea-level temperatures are now omitted and average surface temperatures substituted. The isotherms cannot be drawn in such detail as might be desired, for data from only the regular Weather Bureau stations are used.

The prevailing wind directions are determined from hourly observations at almost all the stations. A few stations determine their prevailing directions from the daily or twice-daily observations only.

CHART VII.—Wind roses for selected stations.—The publication of this chart began in the REVIEW for January 1935, and gives wind roses for 28 selected stations. The roses are based on hourly percentages for the month.

CHART VIII.—Total snowfall.—This is based on the reports from regular and cooperative observers and shows the depth in inches of the snowfall during the month. In general, the depth is shown by lines connecting places of equal snowfall, but in special cases figures also are given. This chart is published only when the snowfall is sufficiently extensive to justify its preparation. The inset on this chart, when included, shows the depth of snow on the ground at 8 p. m. of the Monday nearest the end of the month and is a copy of the snow chart appearing in the snow and ice bulletin for that week.

CHARTS IX, X, etc.—North Atlantic weather maps for particular days.

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, January 1936

Section	Temperature								Precipitation					
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama.....	45.7	-0.7	Pushmataha.....	80	17	Valley Head.....	-11	31	12.34	+7.50	Brantley.....	12.34	Riverton.....	3.03
Arizona.....	43.7	- .5	Goulds Ranch.....	80	11	Fort Valley.....	-4	2	.78	- .34	Oracle.....	2.60	2 stations.....	T
Arkansas.....	37.1	-4.2	Magnolia.....	83	16	4 stations.....	-1	24	1.05	-3.17	Crossett.....	4.59	Fayetteville.....	.13
California.....	46.6	+1.8	Indio.....	85	23	Twin Lakes.....	-6	12	5.00	+1.17	Cummings.....	27.41	6 stations.....	.00
Colorado.....	25.0	+ .9	Longmont.....	74	11	Fraser.....	-33	30	.76	.0	Steamboat Springs.....	4.48	3 stations.....	T
Florida.....	58.9	- .1	Brooksville.....	88	6	2 stations.....	20	128	5.11	+2.31	Garniers.....	18.65	West Palm Beach.....	1.64
Georgia.....	44.0	-2.9	Fargo.....	82	18	Dalton.....	-6	31	9.21	+4.94	Flat Top.....	17.32	Fargo.....	3.15
Idaho.....	24.1	- .1	Kooskia.....	66	15	Tetonia.....	-35	26	3.76	+1.55	Roland.....	12.08	Howe.....	.55
Illinois.....	20.7	-5.8	4 stations.....	66	12	Freeport.....	-27	23	1.40	- .88	Mount Carmel.....	2.09	Chester.....	.56
Indiana.....	22.4	-6.6	2 stations.....	65	12	Marengo.....	-27	28	1.47	+1.56	Scottsburg.....	2.86	Goshen.....	.75
Iowa.....	9.5	-9.0	Keokuk.....	56	12	Elkader.....	-33	24	1.68	+ .60	Tingley.....	3.85	Inwood (near).....	.45
Kansas.....	26.3	-3.5	2 stations.....	70	11	Horton.....	-21	27	.71	+ .05	Leavenworth.....	1.99	Norton.....	.10
Kentucky.....	29.4	-7.9	Murray.....	68	12	Taylorsville.....	-25	28	2.99	-1.34	Jackson.....	5.69	Owensboro.....	.95
Louisiana.....	49.6	-2.0	Urania.....	85	16	2 stations.....	12	28	5.17	+ .33	Paradis.....	11.54	Plain Dealing.....	1.23
Maryland-Delaware	28.1	-5.9	Snow Hill, Md.....	62	13	Oakland, Md.....	-20	25	6.00	+2.70	Dover, Del.....	7.95	Chewsville, Md.....	3.89
Michigan.....	18.1	-2.9	2 stations.....	48	12	2 stations.....	-26	19	1.85	+ .01	Deer Park.....	4.52	Yale.....	.45
Minnesota.....	-1.4	-10.8	do.....	40	12	Warroad.....	-55	23	.76	+ .01	Fairmont.....	1.62	Alexandria.....	.07
Mississippi.....	44.1	-3.2	Columbla.....	82	6	Tupelo.....	-10	31	6.20	+1.16	Gulfport.....	13.35	Yazoo City.....	2.25
Missouri.....	24.4	-6.4	Garber.....	74	12	Conception.....	-25	27	1.01	-1.30	King City.....	3.61	2 stations.....	.05
Montana.....	17.2	-2.5	Norris (near).....	60	4	Glasgow.....	-43	19	1.02	+ .14	Haugan.....	7.02	Ennis.....	.09

¹Other dates also.